



Ocean Stewardship in the National Parks *Updates and Accomplishments*



Restoring Fish Populations and Sustaining Recreational Opportunities

Marine Reserves Aim at Restoring Ecosystems in National Parks. “No-take” marine reserves have been established in five ocean Parks, most recently in Dry Tortugas National Park. On November 14th 2006, the State of Florida concurred with NPS regulations to establish the Dry Tortugas National Park Research Natural Area (RNA), a marine reserve occupying 46 square miles of the park. The RNA and reserves established at Buck Island Reef National Monument and Virgin Islands Coral Reef National Monument share similar objectives, to sustain tropical marine ecosystems and protect fragile coral reefs, seagrass beds and the marine species they support from fishing and anchor damage. Channel Islands National Park, California, and Glacier Bay National Park, Alaska, established marine reserves for similar purposes; to restore fish populations, allow temperate ecosystems to recover and ensure future recreational opportunities at these parks.

Research and Monitoring Move Forward at Marine Reserves. The National Park Service has a clear mandate to employ the best available science to evaluate the performance of these new reserves, and to adapt its management program according to how resources are responding to protection. The kelp forest monitoring program at Channel Islands NP, and the biogeographic assessments of coral reefs and inventories of fish and invertebrates at the Virgin Islands parks are yielding critical information to meet these adaptive management goals. However, important research questions remain. For example, what are expectations for fisheries to rebound in light of pressures from fishing outside these reserves? Will marine reserves help reverse declines and restore ecosystem structure and function, in spite of stresses other than fishing? The USGS Eastern Region has pledged to commit over \$300,000 per year in matching funds for competitive research to explore these and other questions at Dry Tortugas and the Virgin Islands parks.

Above Left: A scuba diver explores the kelp forests at Channel Islands National Park.

Top Right: San Juan National Historic Site in Puerto Rico.

Bottom Right: Big Eye at Dry Tortugas National Park.



Biscayne National Park Fisheries Plan Moves Forward. The Park Service and the Florida Fish and Wildlife Conservation Commission have developed a proposed Draft Environmental Impact Statement for the joint fisheries management plan for Biscayne National Park. The joint plan is the first of its kind in the National Park System to be based on quantifiable, desired conditions for restoring and maintaining fish stocks. The plan will transcend jurisdictional boundaries to reverse drastic declines in coral reef fish and shellfish in and around the park, and help to ensure future recreational opportunities. A working group of recreational anglers, commercial fishermen, scuba divers and conservation groups provided extensive input into designing the Plan.

Increasing Scientific Understanding of Ocean and Coastal Parks

Coastal Assessments Reveal Condition of Park Resources: The NPS Watershed Condition Assessment Program has completed scientific assessments of 16 coastal parks through the Natural Resource Challenge. These assessments are valuable tools for guiding resource management planning and development of resource monitoring plans. Multi-disciplinary teams integrate the physical and biological sciences with geospatial databases to characterize the health of coastal park resources, and reveal factors that may cause impairment, including pollution, watershed degradation, invasive species and extractive uses. NPS Water Resources Division has initiated assessments in 41 coastal and Great Lakes parks and plans to conduct assessments for 14 additional coastal parks.

Research Learning Centers (RLCs) Advance Ocean Science and Education: National Park Service RLCs are galvanizing local organizations, schools, universities, government agencies and citizens to participate in park-based ocean research, education and volunteer projects. Eight coastal RLCs are engaging citizens in monitoring water quality and shellfish health, eradicating aquatic invasive species and other projects. Scientific studies leveraged by Centers provide critical information to assist the parks in managing ocean and coastal resources. For example, students and volunteers experience the scientific process by conducting the Tomales Bay Biodiversity Inventory (TBBI) at the Pacific Coast Science and Learning Center. The Inventory has identified over 2,000 species, identified a new threat from a previously unknown invasive tunicate,

and obtained millions of dollars in grants for protection and restoration of this important estuary at Point Reyes National Seashore, California.

Monitoring Threats to Ocean Park Resources

Monitoring Networks Integrate Science to Support Park Managers. Thirteen NPS Inventory and Monitoring (I&M) Networks acquire and integrate scientific information to support conservation of ocean and coastal resources in the National Park System. Underwater habitats in many Parks have not yet been mapped and marine plant and animal communities are unknown or poorly understood. Acquiring these habitat maps and knowledge of the abundance and distribution of marine species will be essential to managing these resources. The parks and I&M Networks are developing Geographic Information System (GIS) maps and databases, taking inventories of species, and designing scientifically and statistically rigorous monitoring plans (Vital Signs) to track ecological conditions of coastal and ocean parks, working with U.S. Geological Survey, NOAA, state agencies and academic partners.

NPS and USGS Respond to Major Caribbean Coral Bleaching Event. Through intensive long-term monitoring at Virgin Islands National Park and Buck Island Reef National Monument, the NPS South Florida/Caribbean I&M Network and USGS Caribbean Field Station were able to statistically quantify the scale and extent of coral bleaching and death from the most severe coral bleaching event ever recorded in the Virgin Islands. Already weakened by bleaching, many corals suffered a “one-two punch” when attacked by disease. As a result, nearly 50% of live coral cover among major reef building species died at six sites. USGS and NPS also measured bleaching of elkhorn corals (*A.palmata*), a species recently listed as threatened under the Endangered Species Act, of which 50% bleached at monitoring sites on St. John. Long term monitoring efforts and microbial research will support development of habitat and species protection plans under new rules for elkhorn and staghorn (*A.cervicornis*) corals.



From Top: Shipwrecks often provide critical habitat for marine life.

Ten national parks are working to conserve valuable coral reef resources. In 2006, the National Oceanic and Atmospheric Administration listed both elkhorn (shown here bleached on the top and healthy on the bottom) and staghorn coral as threatened under the Endangered Species Act.